

MISSOURI CONSERVATIONIST

VOLUME 82, ISSUE 8, AUGUST 2021
SERVING NATURE & YOU



BECOME HUNTER EDUCATION CERTIFIED ONLINE TODAY!

Missouri adults 16 and older can complete hunter education training all online.

- ✕ Flexibility to learn at your own pace
- ✕ Access 24/7
- ✕ No in-person skills session required



The all-online course includes engaging video and animation on hunter safety, firearm safety, ethics, regulations, and wildlife management.



Serving nature and you®

LEARN MORE ABOUT MDC'S HUNTER EDUCATION
PROGRAM AT [MDC.MO.GOV/HUNTEREDUCATION](https://mdc.mo.gov/huntereducation)

Contents

AUGUST 2021
VOLUME 82, ISSUE 8



10



16

FEATURES

10 The Art of Missouri's Conservation

Past, present, and future.

by Brian Flowers

16 Beneath the Water's Surface

Snorkeling offers unique
view of stream life.

by Doug Novinger

22 Youth Shooting Sports

A gateway to firearms safety,
outdoor skills, and self-confidence.

by Francis Skalicky



22

DEPARTMENTS

- 2 Inbox
- 3 Up Front With Sara Parker Pauley
- 4 Nature Lab
- 5 In Brief
- 28 Get Outside
- 30 Places To Go
- 32 Wild Guide
- 33 Outdoor Calendar



Prairie lizard

MISSOURI CONSERVATIONIST



ON THE COVER

Woodland crayfish

by JIM RATHERT

GOVERNOR

Michael L. Parson

THE CONSERVATION COMMISSION

CHAIR Don C. Bedell

VICE CHAIR Wm. L. (Barry) Orscheln

SECRETARY Mark L. McHenry

MEMBER Steven D. Harrison

DIRECTOR

Sara Parker Pauley

DEPUTY DIRECTORS

Mike Hubbard, Aaron Jeffries,
Jennifer Battson Warren

MAGAZINE STAFF

MAGAZINE MANAGER

Stephanie Thurber

EDITOR

Angie Daly Morfeld

ASSOCIATE EDITOR

Larry Archer

PHOTOGRAPHY EDITOR

Cliff White

STAFF WRITERS

Bonnie Chasteen, Kristie Hilgedick,
Joe Jerek

DESIGNERS

Shawn Carey, Marci Porter

PHOTOGRAPHERS

Noppadol Paothong, David Stonner

CIRCULATION MANAGER

Laura Scheuler

mdc.mo.gov/conmag



Download this
issue to your
phone or tablet at
mdc.mo.gov/mocon.



Inbox



Letters to the Editor

Submissions reflect readers' opinions and may be edited for length and clarity. Email Magazine@mdc.mo.gov or write to us:

MISSOURI
CONSERVATIONIST
PO BOX 180
JEFFERSON CITY, MO 65102



SNAKE TREK
Fabulous and informative *Snake Trek* article and photography by Dan Zarlenga [June, Page 22]. I enjoy your wonderful magazine each month. It is always superlative reading.

Judy Kohm
via email

SNAKE TREK

I thoroughly enjoyed your article on copperheads. When I was a young Girl Scout camp counselor at Camp Cedarledge in Pevely, the nature specialist had a live copperhead to show all the campers. She released it into the woods once camp came to an end for the summer. Such a great experience!

Sue DiPiano New Melle

I have read your magazine for almost six years, since our move from Iowa to Missouri. *Snake Trek* made me look at snakes in an entirely new way. As a Trekker since age 16, I have loved each and every rendition of *Star Trek*, as well as all the movies. It touched my soul as you intertwined Trek vernacular and also used the Trek font for each section. "Live long and prosper."

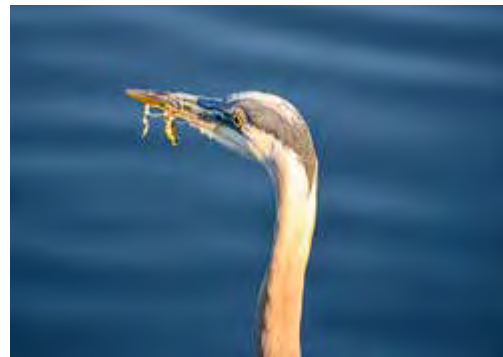
Marcy Wenberg Kirksville

INSECTS IN NEED

I am in my late 60s and have my own unscientific way of determining that the insect population has drastically declined [*Insects in Need*, May, Page 22]. From the time I was a child until somewhere around my early 30s, whenever we gassed up our cars, we also had to clean insects off our car windshields to see the road. That no longer happens, even on long road trips. So, either the

insects have gotten smart enough to avoid cars or we have a lot less bugs.

Mary Ann B. Ford
Kirkwood



ALWAYS LEAVE NATURE BETTER

I've been watching this great blue heron that hangs around Drake Harbor in Warsaw. Obviously, an angler failed to clean up his or her mess. It makes me sick to watch this poor thing try to swallow fish it catches. They bounce off the fishing line and fall back into the water. I have seen it swallow things it gets through the end of its beak, but they are very small morsels from fish remains left behind by anglers.

Maureen McNeil via email

Please leave nature better than how you find it. Leave all areas you visit with anything you bring in, including discarded fishing line. This is just one example of the dangers that await wildlife at the hands of careless humans. —THE EDITORS

MAKING CONNECTIONS

I teach English online to students in China. Every so often, I send one of my students a batch of *Conservationist* and *Xplor* magazines. I recently started an insect unit with my student. We were beginning to talk about the life cycle of butterflies. She very excitedly whipped out her July 2020 edition of the *Conservationist* [*From Big-Eyed to Beautiful*, Page 10]. She was so excited to be able to make a connection with me. Thank you for the wonderful articles and pictures.

Miranda Kurbin Kansas City

Connect With Us!



/moconservation



@moconservation



@MDC_online

Conservation Headquarters

573-751-4115 | PO Box 180, Jefferson City, MO 65102-0180

Regional Offices

Southeast/Cape Girardeau: 573-290-5730

Central/Columbia: 573-815-7900

Kansas City: 816-622-0900

Northeast/Kirksville: 660-785-2420

Southwest/Springfield: 417-895-6880

Northwest/St. Joseph: 816-271-3100

St. Louis: 636-441-4554

Ozark/West Plains: 417-256-7161

Have a Question for a Commissioner?

Send a note using our online contact form at mdc.mo.gov/commissioners.



Want to see your photos in the Missouri Conservationist?

Share your photos on Flickr at
flickr.com/groups/mdcreaderphotos-2021,
email Readerphoto@mdc.mo.gov,
or include the hashtag #mdcDiscoverNature
on your Instagram photos.



1 | Raccoon by
Mark Duchesne,
via Flickr

2 | Parker fishing
on the Gasconade
by Justin Landon,
via email

3 | Midland water
snake by Kathy
Bildner, via Flickr



MISSOURI CONSERVATION COMMISSIONERS



Don
Bedell



Steven
Harrison



Mark
McHenry



Barry
Orscheln



Up Front

with Sara Parker Pauley

✳️ **Sitting around a firepit on a cool summer evening** recently, one of our friends jumped to his feet and pointed to the western sky. We all jumped up, uttering words of amazement, as we witnessed a long linear string of SpaceX's Starlink satellites orbiting the earth. They disappeared almost as quickly as they appeared.

I admire the determination of visionaries like Elon Musk — for his space-age satellites and his next quest to develop rockets bound for Mars. But like Dorothy, I tend to think there's no place like home ... as in planet Earth. We have plenty of work to do here to ensure we have a livable planet for those of us who decide to remain.

This question about our future came to mind when I read this month's article on the magnificent murals of Charles W. Schwartz depicting the last two centuries of the conservation story in Missouri — its challenges and successes (see *The Art of Missouri's Conservation* on Page 10). I wondered what future murals might reveal about how we faced the conservation challenges of today and tomorrow, such as species decline, habitat loss, relevancy of nature to a changing society, and a changing climate.

Yes, we have a lot to tackle, but the future depends on our continued commitment to action today. And looking to Schwartz's murals and the long history of public commitment to conservation in Missouri, my optimism endures. As Dietrich Bonhoeffer noted, "The ultimate test of a moral society is the kind of world it leaves its children."

Sara Parker Pauley

SARA PARKER PAULEY, DIRECTOR
SARA.PAULEY@MDC.MO.GOV

The *Missouri Conservationist* (ISSN 0026-6515) is the official monthly publication of the Missouri Department of Conservation, 2901 West Truman Boulevard, Jefferson City, MO (Mailing address: PO Box 180, Jefferson City, MO 65102.) **SUBSCRIPTIONS:** Visit mdc.mo.gov/conmag, or call 573-522-4115, ext. 3856 or 3249. Free to adult Missouri residents (one per household); out of state \$7 per year; out of country \$10 per year. Notification of address change must include both old and new address (send mailing label with the subscriber number on it) with 60-day notice. Preferred periodical postage paid at Jefferson City, Missouri, and at additional entry offices. **POSTMASTER:** Send correspondence to Circulation, PO Box 180, Jefferson City, MO 65102-0180. Phone: 573-522-4115, ext. 3856 or 3249. Copyright © 2021 by the Conservation Commission of the State of Missouri.

Equal opportunity to participate in and benefit from programs of the Missouri Department of Conservation is available to all individuals without regard to their race, color, religion, national origin, sex, ancestry, age, sexual orientation, veteran status, or disability. Questions should be directed to the Department of Conservation, PO Box 180, Jefferson City, MO 65102, 573-751-4115 (voice) or 800-735-2966 (TTY), or to Chief, Public Civil Rights, Office of Civil Rights, U.S. Department of the Interior, 1849 C Street, NW, Washington, D.C. 20240.

Printed with soy ink



mdc.mo.gov **3**

Nature LAB

by Bonnie Chasteen

Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

PROTECTING AQUATIC LIFE

Fish Kill and Pollution Program

✳ You'll know a fish kill when you see or smell it — the sudden appearance of dead fish in a lake or stream.

"Half of reported fish kills are caused by natural events like temperature extremes, lack of oxygen in the water, and disease," said MDC Scientist Rebecca O'Hearn. She heads up Missouri's Fish Kill and Pollution Investigation Program. "The rest are caused by pollution — human and livestock waste, chlorinated drinking water, or chemical spills," she said.

Every year, MDC handles around 100 fish kill and other water-quality events that pose a threat to fish, wildlife, and recreation.

The program celebrated its 80th anniversary in 2019. "MDC initiated it in 1939 to tackle the state's significant pollution problems at the time," said O'Hearn. The program works in collaboration with the Missouri Department of Natural Resources (DNR), the state's pollution control agency, to investigate, mitigate, and enforce Missouri's Clean Water Law (MCWL) for pollution incidents.

She noted that managers can prevent or solve



MDC Fisheries staff count and sort dead fish to collect evidence after a fish kill at Truman Dam in 2013. Their efforts helped the program assess damages to the Truman Reservoir fishery.

82-year effort has helped reduce fish kill and water pollution incidents

many natural fish kills in ponds and lakes by maintaining oxygen levels through algae control, including reducing nutrient inputs or applying algicides or aeration.

When fish kills are caused by a pollutant, more solutions are required to remedy the problem.

"When a violator can be identified, they are charged the cleanup costs and monetary damages, which compensate the state for losses of fish and wildlife," O'Hearn said. Depending on the circumstances leading to the fish kill, DNR may also assess a penalty for violations of the MCWL.

"MDC uses compensated damages for fish and wildlife recovery and improvement of aquatic habitats," O'Hearn said.

To report fish kills and pollution, see Be the Solution below.

Fish Kill Program at a Glance

Partner Roles	Conservation	Both	Natural Resources
	<ul style="list-style-type: none"> Determines cause Assesses fish & wildlife damage Recommends restoration 	<ul style="list-style-type: none"> Notifies authorities Responds on-scene Collects evidence Sends press releases 	<ul style="list-style-type: none"> Remediates pollution Collects penalties Assesses water quality damage Collects damages & investigative cost

Goals

- Protect aquatic resources
- Maintain high quality fishing and recreation

Pollution Sources

- Municipal
- Agricultural
- Industrial
- Transportation
- Land disturbance and residential runoff

Long-Term Pollution Trends

Dropped from a high of 60 pollution kills in 1991 to a low of 4 pollution kills in 2018

Be the Solution — Report Pollution

To report fish kills and pollution call your local MDC office or DNR at 573-634-2436.

In Brief

News and updates from MDC



MISSOURI CONSERVATION COMMISSION APPROVES CHANGES TO CWD SURVEILLANCE, MANAGEMENT EFFORTS

THE CHANGES REINSTATE MANDATORY SAMPLING, ADD FOUR COUNTIES TO THE MANAGEMENT ZONE

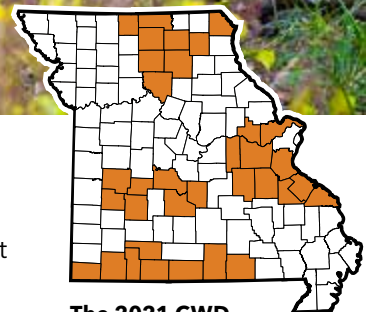
➔ During its May 21 open meeting, the commission added Camden, Laclede, McDonald, and Pulaski counties to the CWD Management Zone.

The four counties were added because CWD was found in or near them. With the additional counties, the CWD Management Zone consists of 34 counties.

MDC confirmed 44 new cases of CWD from more than 15,300 deer tested during the past year. Of the 44 new cases, one was found in Pulaski County, which had no previously known cases of CWD. Due to the detection of CWD in Pulaski County, MDC recommended that Pulaski County and adjacent Camden and Laclede counties be placed in the CWD Management Zone. Due to the CWD-positive deer in northern Benton County in Arkansas within 10 miles of McDonald County in Missouri, MDC recommended that McDonald County be added to the CWD Management Zone.

The commission also gave its approval to reinstate mandatory CWD sampling for the coming deer season. Counties designated for mandatory CWD sampling must be approved by the commission each year. As a result of COVID-19, MDC waived the mandatory sampling requirement for last year's opening weekend.

Hunters who harvest deer in any counties of the CWD Management Zone during opening weekend of the November portion of firearms deer season (Nov. 13–14) are required to take their harvested deer (or the head)



**The 2021 CWD
Management Zone
includes 34 counties.**

continued on Page 6 »

CWD REGULATION CHANGES

(continued from Page 5)

on the day of harvest to one of MDC's mandatory CWD sampling stations throughout the zone.

Hunters must follow carcass-movement restrictions when traveling to a mandatory CWD sampling station. Hunters must present their deer (or the head) to a mandatory CWD sampling station within the county of harvest, with a few exceptions. Deer that will be delivered to a permitted meat processor or taxidermist within 48 hours, or deer heads that will be left at an MDC mandatory CWD sampling station for disposal after sampling, may be transported to a sampling station in any county.

CWD regulations prohibit the placement of feed or minerals for deer in counties in the CWD Management Zone. For the four counties newly added to the CWD Management Zone, the deer feeding ban became effective July 1. Additionally, deer transportation regulations effective within all CWD Management Zone counties limit the transportation of some deer parts outside of the county of harvest.

Also related to CWD management, MDC has removed the antler-point restriction (APR) for the upcoming deer season in Camden and Pulaski counties. Younger bucks, which are protected under the APR, are more likely to disperse and potentially spread CWD. Therefore, removing the APR within the CWD Management Zone minimizes the risk of disease spread to other areas.

Also beginning this fall, hunters may fill two Firearms Antlerless Deer Hunting Permits in Camden, Laclede, and Pulaski counties.

Additional information on these and other regulations will be included in MDC's 2021 Fall Deer & Turkey Hunting Regulations and Information booklet, available where permits are sold and online at short.mdc.mo.gov/ZVo.

CWD is a deadly disease in white-tailed deer and other members of the deer family. The purpose of MDC's CWD sampling and testing efforts is to find cases as early as possible so the department can limit the spread of the disease by implementing management actions. The total number of known CWD cases in the state is 206. MDC has tested more than 152,300 deer since the first cases of CWD were found in free-ranging deer in Missouri in 2012. For more information on CWD and MDC efforts to limit the spread of the disease, visit mdc.mo.gov/cwd.



Ask MDC

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov
or call 573-522-4115, ext. 3848.

Q: I've spotted this red fox on several occasions. It appears to have longer legs than a typical fox. Can you explain why?

➔ Like juveniles of many species, this lanky fox (*Vulpes vulpes*) has not yet grown into its ears and legs. It also appears to be healthy but slightly underweight, which contributes to the illusion its legs are unusually lengthy.

Rabbits, mice, and rats are staples of a red fox's diet. When food is plentiful, a fox typically kills more than it eats. This surplus is usually buried in the ground or covered with grass or leaves and sprinkled with urine. Red foxes can eat about a pound of meat at a feeding. Foxes often capture and store shrews and moles, but they rarely eat them. Sometimes the cached food is discovered and eaten by skunks, crows, owls, hawks, or other foxes.

When stalking prey, a fox either takes high, deliberate steps or crouches low and approaches surreptitiously. It then rushes or pounces on the unwary victim, which is killed by a bite from its powerful jaws.

Red foxes prefer the borders of forested areas and adjacent open lands, avoiding dense and extensive forests. During most of the year, red foxes sleep on the ground in



Red fox

sheltered spots. During the breeding season, though, they provide a den for their young. In urban and suburban areas, many people enjoy their encounters with foxes. To learn more about these canines, visit short.mdc.mo.gov/ZHz.

Q: I found this frog in my pool. What species is it?

➔ This is a wood frog, *Lithobates sylvaticus*. These frogs are tan, pinkish tan, or brown and sport a dark brown mask through the eyes and ears.

In Missouri, this rare species lives in cool, forested ravines where small, fishless ponds or pools are available for late

RED FOX: TOM STRUTZ; WOOD FROG: MARY CAVE JONES



Wood frog

winter to early spring breeding. They live mainly in mature forests on the eastern side of the state and are known to overwinter on land beneath deep layers of leaves or under moist logs.

Wood frogs are a species of conservation concern in Missouri; however, they are expanding their range and becoming more common

throughout parts of Missouri. They have quite a large range from New England to Alaska with numerous isolated populations as far south as Arkansas and Alabama.

Wood frogs feed on a variety of insects and other invertebrates. Their voice is a quick series of *waaaduck* sounds. To learn more about these frogs, visit short.mdc.mo.gov/ZHD.



Sean Ernst

SULLIVAN COUNTY
CONSERVATION AGENT

offers this month's

AGENT ADVICE

Conservation areas provide opportunities to enjoy the last remaining days of summer and get out in nature — all while staying close to home. Many conservation areas allow camping if you're looking for a quick get-away. Missouri is a great place to fish, and conservation areas are a great place to start. Be sure to have the proper permits and you're set to try and catch the latest state record fish! Two small-game seasons are still in full swing — squirrel and bullfrog/green frog seasons. Both seasons are excellent ways to introduce hunting and angling to youth. For information on both seasons, visit mdc.mo.gov/seasons. To find a conservation area near you, visit mdc.mo.gov/atlas. Get out and enjoy August!

What IS it?

Can you
guess this
month's
natural
wonder?

*The answer is on
Page 9.*

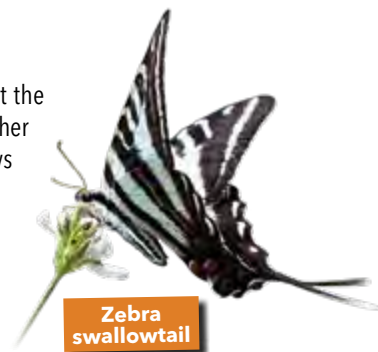




DISCOVER NATURE AT THE MISSOURI STATE FAIR

Discover nature with MDC at the Missouri State Fair in Sedalia Aug. 12–22. Visit the Conservation Building on the fairgrounds from 9 a.m. to 7 p.m. to see live fish and other native animals, including snakes, turtles, and amphibians. Enjoy educational displays about native plants that help butterflies and other important pollinators. Ask MDC staff conservation-related questions, get educational materials, and have fun.

Aug. 13 is Missouri Department of Conservation Day — a full day of fun and excitement sponsored by MDC. For a complete list of events happening on Aug. 13, check out mostatefair.com/schedules/friday-aug-13.



Zebra swallowtail



BLACKBERRY GELATO

Nothing tastes better on a hot summer day than a cool, icy treat. This recipe delivers the coolness you crave during the dog days of summer with the sweet, juicy kick of Missouri's own blackberries. This Italian ice cream will have you screaming for more!

Courtesy of *Cooking Wild in Missouri*
by Bernadette Dryden

Serves 6

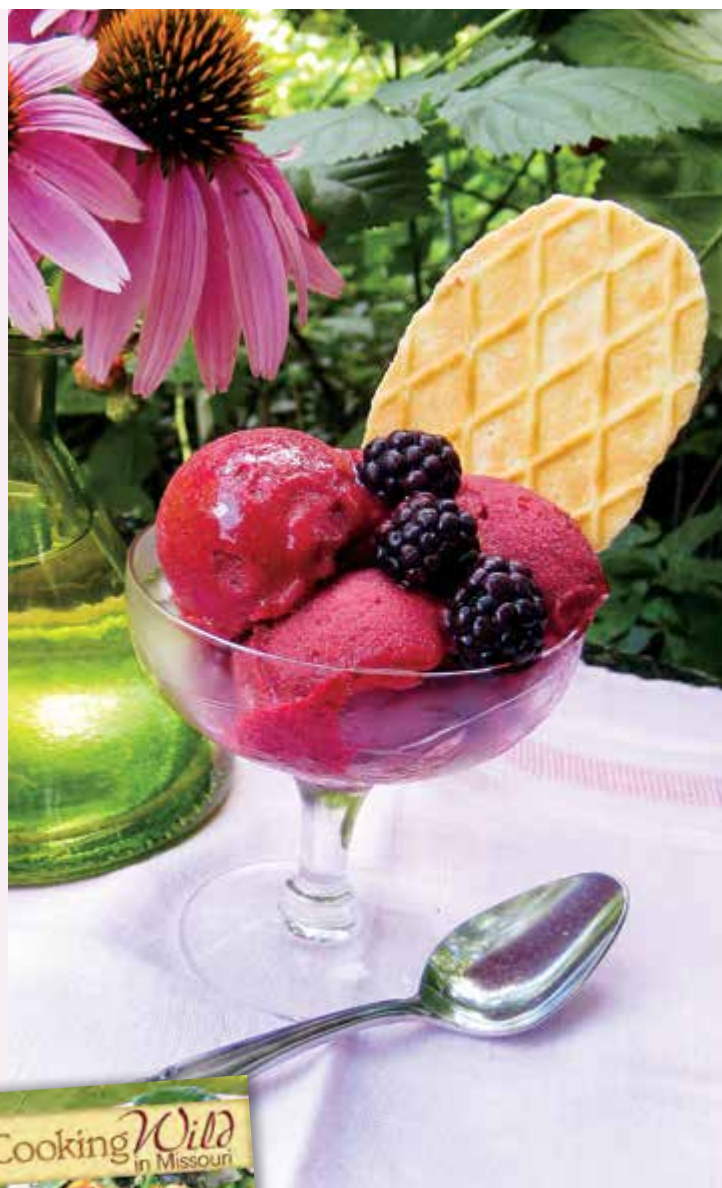
INGREDIENTS:

- 1 pound blackberries (about 2 cups)
- $\frac{3}{4}$ to 1 cup sugar
- $\frac{1}{2}$ cup water
- $\frac{1}{2}$ cup heavy cream or plain yogurt
(I use low-fat, but whole milk works also)

MIX blackberries and sugar in food processor until thoroughly blended. Then add water and blend well again. Taste for sweetness. Press mixture through a fine-mesh strainer into a metal bowl, leaving solids in strainer. Set aside.

If using cream, **WHIP** it in another bowl until it thickens slightly (to the consistency of buttermilk). Whisk cream or yogurt gently into the fruit mixture, combining thoroughly. Taste — the fruit flavor should shine through. Add more sugar if you find it not sweet enough (however, it's best to add sugar while mixture is still in the food processor and can be spun around again). If you like it now, you'll love it after it's frozen. Cover bowl and chill for at least 1 hour. I often leave it overnight in the refrigerator.

POUR into container of your ice-cream maker and freeze, following the manufacturer's instructions. This makes about 3 cups of gorgeously purple-red gelato. Dip it up into your prettiest dessert dishes and top with pieces of fruit.



Cooking Wild in Missouri is available for \$16 at most MDC nature centers. To order, call toll-free 877-521-8632 (shipping and handling charges will apply).



READER SURVEY

Sharing content our readers learn from and enjoy is the magazine team's top priority. To better understand our readers, we rely on you to occasionally provide feedback, which in turn helps us deliver the best content.

If you haven't already taken our short reader survey, you can do so now online at short.mdc.mo.gov/ZzK, or scan the QR code with your smartphone.

- 1 Open the camera app from your device.
- 2 Point the camera at the QR code. The camera will scan the QR code automatically (if it does not, check camera settings to ensure this is enabled).
- 3 A notification will pop up prompting you to open qualtrics.com.
- 4 Tap the notification. This opens the URL contained within the QR code.
- 5 Take the survey to give us your feedback!



QR code



EXPLORE OUTDOORS WITH AGENTS OF DISCOVERY APP

Looking for a new way to explore and learn about Missouri's outdoors? Check out Agents of Discovery, a free mobile gaming app. MDC is partnering with the app to help the public explore natural areas around the state. Complete nature-based "missions" at home, while visiting an MDC nature or visitor center, or while attending MDC events, such as Eagle Days or the Missouri State Fair.

Look for MDC's first missions at Runge, Cape Girardeau, Burr Oak Woods, and Powder Valley conservation nature centers. The first event-based mission will be at the Conservation Building during the Missouri State Fair in Sedalia Aug. 12–22. New missions will launch every three months.


Agents of Discovery is available for download through the App Store for Apple products or Google Play for Android devices. For more information on Agents of Discovery, visit short.mdc.mo.gov/ZHR.

WHAT IS IT?

RUBY-THROATED HUMMINGBIRD

Ruby-throated hummingbirds peak this month as northern hummers begin to migrate through. These tiny birds with long needlelike bills are a delight to watch, whether feeding from flowers in your garden or from a nectar feeder. They hover, flying forward and backward with a humming sound. Males are easy to spot with their namesake red throat, which isn't as prominent in immature hummers like the one pictured here.





Mountain
lion



Mallard

The Art of MISSOURI'S CONSERVATION

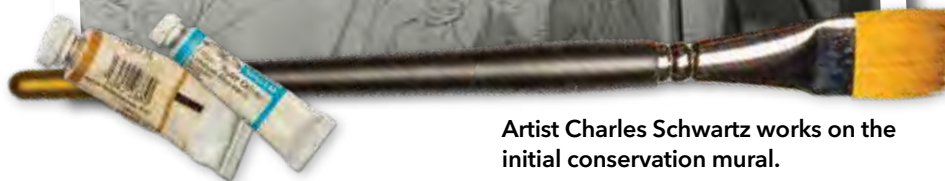
Past, Present, and Future

by Brian Flowers

Missouri became the 24th state in the union on Aug. 10, 1821. We will celebrate that 200-year milestone — or bicentennial — this year.

As you might imagine, Missouri in 1821 looked much different than what you see today as you travel down highways, along rivers, and through cities and towns.

In seeking to understand this historical milestone, we can examine 200 years of Missouri's wildlife and conservation history through the artwork of conservation pioneer and artist Charles W. Schwartz.



Artist Charles Schwartz works on the initial conservation mural.

The Artist

Charles W. Schwartz (1914–1991) joined the Missouri Conservation Commission as a biologist in 1940. Along with his wife, Libby, Schwartz served as an artist and filmmaker for 41 years until his retirement in 1981. In 1965, Schwartz began work on a series of murals to pictorially tell the story of conservation from the state's pre-settlement condition and early exploitation

of resources, through the formation of the conservation commission to the present conservation movement. The series, consisting of eight separate murals, was completed in 1987, just in time for the 50th anniversary of the Missouri Department of Conservation.

Today, as you enter the lobby of the Commission Headquarters in Jefferson City, you are surrounded by his depiction of Missouri's conservation story.



Pristine Missouri

Pristine Missouri

In his first mural, Schwartz depicts wildlife species most associated with Missouri's forests prior to European settlement. The mountain lion, white-tail deer, wild turkey, and ruffed grouse feature prominently in this mural. Historically, forests covered 30

million acres of Missouri's Ozark hills and consisted of old growth pine, oak, and hickory trees. Bottomland forests followed streams and rivers and mixed with dense cane breaks. In other areas open woodlands and parklike savannas, consisting of large, dispersed trees with

grass understory dominated the landscape. The river otter was found in abundance in Missouri rivers, where large fish swam in deep, clear water. Birds, like the colorful Carolina parakeet, were seen in Missouri skies. The now extinct bird formed large flocks, was often written about, and appears in early American artwork. A lone Native American man catching a catfish represents the early cultures who hunted, fished, and lived in a mostly unaltered natural landscape.

1700s

The second largest habitat in Missouri consisted of 15 million acres of prairies, and Schwartz chose this as the focus of his second mural. Ranging from tall grass prairies to sand prairies and loess hill prairies, Missouri was home to a diverse mix of native grasslands supporting a rich abundance of wildlife. The Wazhazhe (Osage) and the Niutachi (Missouria) both lived within Missouri's prairie landscape. A man, perhaps from one of these cultures, is depicted plucking a blue-winged teal as he appears to be observing the abundance the land around him offers.



Elk



1700s



1800s



1800s

Schwartz's third mural depicts the 1800s, the time that most negatively affected Missouri's fish, forest, and wildlife resources, ultimately threatening to end them. With Missouri statehood on Aug. 10, 1821, the flow of westward expansion had begun. The western fur trade was centered in the metropolis of St. Louis, and historic trails, such as those to Santa Fe, Oregon, and California, brought settlers from all over the globe seeking wealth and a new beginning in the west. That influx would put a strain on both natural resources and native people. Over half of the forested lands in Missouri were cut to build railroads, which pushed west from cities that required lumber for new construction. Native prairies were plowed under for crops to feed expanding populations. This mural depicts men sawing lumber from the old growth shortleaf pine of the Ozarks and hacking railroad ties

from oak logs. As the land was denuded of its towering forests, rain eroded the fragile thin soil, choking the once deep clear streams with gravel. Livestock were allowed to "free range," competing with native wildlife for food on an already compromised landscape. All these

practices paved the way for what would come next, the wholesale exploitation of Missouri's wildlife and wild lands.

Exploitation

Once Missouri's natural landscape had been degraded and habitats destroyed, wildlife and fish species could not resist the overwhelming exploitation. Citizens had viewed these resources as inexhaustible — there would certainly be enough, they thought. Wildlife was harvested without regard to season or bag limit. Missourians shopping at meat markets in larger cities could have their pick of black bear, wild turkey, whitetail deer, rabbits, and almost every type of fowl imaginable. The commercialization didn't just encompass the overharvest of fish and wildlife for food. It included the taking of birds for the latest fashions, including feathers for hats and clothing. In his fourth mural, Schwartz represents this time with the extermination and eventual extinction of the passenger pigeon, the netting of fish from a river, a woman shopping for wild birds in a meat market, and the hunting of a whitetail doe with a fawn. There had to be changes — and soon there would be.



Exploitation



The ruffed grouse, once an abundant resident of the thickly forested Missouri River Hills area, is now the focus of an MDC reintroduction effort.



1930s

1930s

For Missourians, the 20th century had dawned much like the old century had gone out. Many wildlife species had been extirpated from the landscape and the few that remained were in dwindling numbers in fragmented habitats. The native elk and bison, which had sustained Missouri's early native people, were now gone. By the mid-1920s, the whitetail deer population included just a few hundred animals and the wild turkey, once considered so numerous that settlers didn't bother to keep domesticated turkeys, were reduced to a few thousand birds in the deep Ozark hills. The time was ripe for a change and nationally that began with a new push for conservation reforms and regulations. In Missouri, it began with the formation of a citizen's organization known today as the Conservation Federation of Missouri. The group consisted of those interested in the non-political management of the fish, forest, and wildlife resources of the state. Through the initiative petition process and collection of signatures, they were successful in placing Amendment 4 on the 1935 ballot, calling for creation of a four-member conservation commission responsible for the management, protection, and

restoration of these resources. The ballot measure passed overwhelmingly with over 71 percent support statewide, and in 1937, a new agency was created. Schwartz captures this pivotal time in his fifth mural by showing those activities that Missourians were engaged in

including hunting, fishing, and trapping. Game species, including bobwhite quail and furbearers like the coyote, are present. A raccoon is perched atop a fence post, where a poster urges support for Amendment 4. The time had come for conservation-minded Missourians to make a difference.

Restoration

The fledgling conservation commission immediately went to work building a science-based wildlife management agency. Their goal — bring back lost or imperiled wildlife. Their focus in the early years was on restoration of the whitetail deer, wild turkey, and the forests that would sustain them. To do that, citizens had to be enlisted to support the commission's restoration efforts. Regulations were enacted, forest fires suppressed, and conservation education brought to every community. Schwartz represents this period in



Restoration



Management

his sixth mural with depictions of the translocation of wild turkey and white-tail deer. Simply put, biologists captured animals to relocate them to new areas of suitable habitat. Included as well is a nod to early forest fire prevention efforts utilizing forest look-out towers dotting the Ozark landscape. A logger cutting an oak tree represents the return of sustainable forestry practices and the forest products industry. Finally, the deer hunter is represented with the fruits of a successful hunt, a large buck. Many advances were made during the period of restoration in the 1940s and 1950s. Conservation was working.

Management

The 1960s were marked with conservation success across Missouri. Between 1944 and 1962, the conservation commission assisted farmers with more than 138,484 ponds and stocked 52,570 lakes and ponds. By 1966, the commission had acquired 23 upland wildlife areas, 180,000 acres of forests, and 42 river accesses for Missourians to connect with their resources.

In his seventh mural, Schwartz emphasizes waterfowl, including the Canada goose, a migratory population



Canada goose

program more self-supporting. To the right side of the mural a young boy catches a bluegill from a farm pond, fisheries biologists use electro-sampling to study fish species, and a conservation agent pulls a catfish from an illegal fish trap. The 1960s were a time of great progress in conservation management and protection, but in 1967 one thing was evident to newly hired Director Carl Noren — the need for secure funding into the future.

More and more citizens were enjoying the now plentiful resources earlier generations worked so hard to reestablish. This increased use placed a greater burden on existing budgets, which had traditionally supported game species and had come from the sale of hunting and fishing permits. Funding had been inadequate for many other species and a new way forward would have to be



1976



The Present

developed if programs and services were to remain effective. Enter the Design for Conservation campaign.

1976

Schwartz's final mural captures the essence and true spirit of conservation, educating the next generation and passing along an appreciation of the natural world. In 1975, Missourians voted to take a giant leap in conservation management of the state's resources. The proposal was called Design for Conservation, but most people refer to it as the one-eighth of 1 percent conservation sales tax. The basic math is that for every \$8 spent on taxable items, one penny is set aside for conservation of the fish, forest, and wildlife resources of the state. The Design for Conservation was passed by Missouri voters and went into effect in 1976. Much of what the plan brought to Missourians included conservation education and interpretive centers as well as the scientific research and protection for many nongame

species, such as the great blue heron, bald eagle, pileated woodpecker, bats, and reptiles. In the center of the mural, Schwartz includes an adult helping children discover nature, a primary mission of the agency from the very beginning in 1937. Finally, he includes a well-deserved recognition of his wife and partner of 53 years, Libby Schwartz. Libby is depicted working on her box turtle research that she carried on from the couple's home near Jefferson City. Next to Libby is one of several family pets, a black Labrador, who assisted in finding the reptiles.

The Present

Today, Missourians are just as dedicated as their ancestors to protecting and preserving our state's fish, forests, and wildlife. Whether fishing one of the state's premier reservoirs, hunting for that elusive wild turkey, or kayaking down a clear, fast Ozark stream, Missourians continue to build upon a long and rich tradition of the wise use of our resources.

Famed conservationist Aldo Leopold once observed about Missouri's conservation tradition: "Conservation at bottom rests on the conviction that there are things in this world more important than dollar signs and ciphers. Many of these other things attach to the land, and to the life that's on it and in it. People who know these things are growing scarcer, but less so in Missouri than elsewhere. This is why conservation is possible here."

These Charles W. Schwartz conservation murals, as well as other decade murals, may be viewed during normal business hours, Monday through Friday from 8 a.m. to 5 p.m. at the Missouri Conservation Commission Headquarters in Jefferson City. ▲

Brian Flowers is a regional supervisor. He loves history and teaching conservation through historic and primitive skills. He and his wife, JoAnne, can often be found exploring Missouri's outdoors.

The background of the page is a photograph of a stream. The top half shows a dense thicket of green trees and branches overhanging the water. The bottom half shows a stream with green, leafy plants growing in the water, their reflections visible on the surface. The water is a murky green color.

Beneath the Water's Surface

SNORKELING OFFERS UNIQUE VIEW OF STREAM LIFE

by Doug Novinger

A great way to beat the summer heat, snorkeling can be a fun and exciting part of experiencing Missouri streams and the variety of life they support.

PHOTOGRAPH BY JOLYN WESTHOFF





Streams offer many wonders, including a hidden world best experienced by snorkeling. Underwater mysteries of the aquatic ecosystem are captivating and especially exciting for kids. A great family experience, streams and snorkeling are for everyone.



Gilled snail



Bleeding shiner



We were eager to get down to the water, but a scattering of stinging nettle and poison ivy encouraged us to pick our way carefully. The song of a burbling riffle just out of sight lured us to a tumble of boulders that stepped down to a shallow pool. Warblers sang in the early summer foliage and a kingfisher chattered in the distance. Dragonflies with white-spotted wings and vibrantly colored damselflies flitted over a stand of water willow, and a turtle slipped from its basking log into the pool. As the stream came into full view, a smallmouth bass crashed into a school of minnows along a gravel bar, startling us.

Missouri streams and the unique environments surrounding them reach out to us with unlimited opportunity for observation, reflection, and recreation. Many of us have experienced streams as destinations for fishing, floating, birding, or just places to poke around and cool off on a hot summer day. However, there is a hidden world just out of sight beneath the water's surface that calls out to be explored. Snorkeling is an easy, fun way to investigate the aquatic life in clear-flowing streams and adds another dimension to enjoying a wondrous resource.

One of our favorite family activities during summer is to gather a few simple items and escape the mid-Missouri heat by heading down to one of many MDC conservation areas that offer access to an Ozark stream. We spend the day exploring, doing a little wade fishing, and snorkeling. Kids are especially drawn to the adventure and mystery associated with streams, but anyone would be amazed by the abundance of species and interesting types of habitats that can only be fully appreciated by seeing them underwater.

Snorkeling is the only practical way to observe some critters in their natural setting and learn about their habitat preferences, feeding behaviors, and how they interact with each other and other species in the aquatic community. Snorkeling is a common technique used by researchers to gather information about aquatic organisms. However, it is in no way restricted to academic pursuits and is perhaps the most basic and easiest method to just see how life unfolds underwater.

Gear Up

In warmer water, snorkeling does not require much gear. In fact, you do not even need a snorkel — a tube that allows you to breathe underwater — to get a glimpse of the diverse aquatic life and habitat that resides just beneath the water surface. However, you do need an adjustable face mask or goggles that fit your face well enough to establish a water-tight seal, but not so snug as to be uncomfortable. A snorkel and face mask will allow continuous underwater viewing with the option of brief, deeper dives if you have mastered clearing the snorkel when you surface. Look for snorkels that conveniently clip to the mask straps and have one-way valves to make it easier to clear water. Some options combine a face-covering mask with a built-in snorkel. It is a matter of preference which setup works better for you. Price and quality of masks and snorkels range widely, and you can find gear that is reliable for occasional use at minimal cost; however, in my experience, the cheapest versions usually do not perform well and may have poor fit, leaky seal, and weak or uncomfortable straps. It does not need to be complicated, but it is worth a few extra dollars, reading reviews, and consulting staff at a dive shop (if possible) where you can try on various styles to make a wise purchase, especially if you intend to snorkel more than a few times per season.

For snorkeling attire, a quick-dry, long- or short-sleeved shirt works well for protection from brushing against rough surfaces and reducing sun exposure, though any old shirt will do. If you frequently scrape against the stream bottom, your shirt will quickly develop persistent stains from the organic layer that coats most underwater surfaces, so you will unlikely be using that shirt for anything else. Some people may prefer long, quick-dry pants to protect their legs as well. Those also defend against the nettle and ivy you might encounter on your way down to the water. Water shoes or wading boots and neoprene socks, or even a pair of old tennis shoes, help guard feet from sharp objects. Waterproof sunscreen and, for some people, a head or neck covering are also important considerations.

Snorkeling in cooler water requires additional layers to hold in body warmth. Even moderately cool water (less than 70–75 degrees in my experience) will limit the length of time comfortably spent submerged without wearing a neoprene wetsuit. Wetsuits come in a variety of styles including one- or two-piece, partially to fully covering arms and legs, and different thicknesses (3 and 5 mm are common) to accommodate a range of temperature conditions. Neoprene hood, vest, gloves, and socks can be added to enhance insulation. Wetsuits are designed to allow water inside, and body heat creates a layer that keeps one quite warm except when bending movements occasionally allow a minor but shocking exchange of cold water down the back. For more extreme conditions, dry suits are available that have (ideally) watertight seals to keep one dry. However, these gears can be expensive, cumbersome, and are generally not necessary to enjoy snorkeling in the warmer water conditions that exist from late spring to early fall. They also add buoyancy, which may or may not be helpful depending on the habitat you intend to explore.



Snorkel



Quick dry shirt



Water shoes / comfortable clothing

Snorkeling doesn't require much gear. A functional mask, snorkel, swim clothes to match temperature conditions, and comfortable water shoes are all you need to get started.

Finding the Right Water

Not every body of water is suited to snorkeling. Moderate to high water clarity and good water quality are important factors. Siltation from eroded soils can blanket the stream bottom, limiting aquatic life and reducing visibility by producing a cloud of suspended sediment when disturbed. Excessive nutrients lead to algal blooms that can also obscure the water column and stream bottom and create a biofilm at the surface that is not pleasant to snorkel through. High densities of livestock and poor animal and water management practices can enhance these problems. Some blue-green algae blooms that are more likely to occur in still waters and high levels of bacteria from animal wastes can pose a health risk to people and pets.

Fortunately, many of Missouri's Ozark and Ozark border streams offer good to excellent snorkeling conditions, particularly during periods when they are stable and flowing at low to moderate levels. Clear waters and diverse habitats composed of relatively clean, rocky substrates allow for a view extending several yards in all directions. Elevated flows and habitats that are especially swift or have high amounts of debris can be dangerous even for strong swimmers and should be avoided. It's hard to appreciate the many interesting things to see underwater when all your effort is focused on just hanging on.

Some lakes, where swimming is permitted, may also offer fun snorkeling opportunities. The lack of flow can make it challenging to escape the cloud of sediment that may be easily stirred up, but water clarity is generally good and swimming easy.

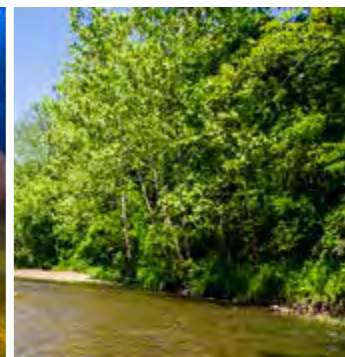
A Zen Moment

Before donning mask and snorkel, it helps to wet your face a bit to ensure a good seal with the mask. A few drops of anti-fog solution, available at dive shops or online stores, smeared on the inside of the mask's face plate creates a clear coating that reduces fogging and keeps water drops from clinging on the glass. In a pinch, saliva works almost as well but is certainly less hygienic. Put the mask on and adjust the straps and orientation of the snorkel so that the components fit comfortably snug, neither too tight nor too loose. Ease into the water and prepare to be amazed.

Snorkeling in streams is best done by moving gradually from downstream to upstream. Move slowly, taking time to inspect the variety of habitats in front and to each side. Gently use hands and toes to propel yourself while minimally contacting the bottom or other structure. The method can resemble something between crawling and rock climbing. Occasionally, stop and wait to see what creatures emerge to investigate this large, new thing that has entered their domain. Also, look behind to see what fish are following, attracted by the opportunity to pluck tiny invertebrates that are set adrift by your activity. Do not be surprised if small sunfish dart in to nip at the hair on your arms or legs. They are harmless but can deliver a startling pinch. Simply resting on the stream bottom and observing the activities of life, movement of material, and reflecting on the way that life and habitat respond to the flowing environment and our influence on it can be a Zen moment.



Several factors influence viewing conditions for snorkeling. However, many Ozark streams feature aquarium-like water clarity during stable low to moderate flows.



Diverse habitats support diverse communities of aquatic species. Explore them while minimizing disturbance to the locations these critters call home.



A diversity of aquatic life awaits discovery in most streams. Amazing varieties of fish, crayfish, mussels, insects, and more are on display to patient and careful snorkelers.



Sunfish



Mussels

Crayfish

Life Below the Surface

There are dozens of species of fish, crayfish, mussels, and other invertebrates that might be seen in a typical Ozark stream. During early spring, males of many fish species show off the brilliant array of colors they express when they establish spawning territories and court females. For instance, watching a multi-species group of colorful shiners interact around a gravel mound nest built by a hornyhead chub or seeing the chub piling small rocks to construct the nest, is an impressive sight. Longear sunfish males also build and aggressively defend spawning nest depressions as summer approaches. Their ornamentation can rival that of any tropical fish, and they are common throughout the Ozarks. If you are very lucky, you might happen across a mussel of the genus *Lampsilis* that is displaying a lure to attract fish that will host the mussel's young, known as glochidia. The lure imitates small fish prey and entices predators like largemouth bass to try to eat the lure so that the mussel may release the glochidia which attach to the fish's gills for a brief period of development (but do not harm the fish). Looking around and occasionally under some of the smaller cobble-sized rocks will reveal the homes of secretive darters, small catfish known as madtoms, crayfish, and a variety of other invertebrates that shelter from predators during daylight.

Exploring different kinds of habitats, with unique forms of depth and flow characteristics and structure, will lead to opportunities to discover different suites of species specialized to use those environments. A waterproof camera offers a great way to capture amazing photos and video of aquatic life. Just like the terrestrial mantra to take only pictures and leave only footprints, it is important to interact with the underwater world responsibly and not significantly disturb habitat by turning large rocks, damaging spawning nests, or removing mussels from the stream bottom substrates where they are lodged. I have always been amazed by the way that fish often respond with apparent curiosity to a snorkeler that is at rest or moving slowly. Even large smallmouth bass sometimes approach closely to inspect the large but non-threatening intruder and perhaps make a meal of one of the many smaller fish that are following and become too careless.

Snorkeling is a truly unique way to explore, appreciate, and learn about the life that exists in our beautiful streams. Like birding and wildlife viewing, it is a mostly noninvasive activity that is easily accessible to people across a wide range of ages, interests, and capabilities, and can be pursued in streams associated with many MDC conservation areas. Children seem to especially love exposure to this secret world that is only revealed when one can see beneath the water's surface. The activity is also easily combined with other fun time in and around the stream and strengthens a desire to understand and protect our precious aquatic resources. Get outdoors and give snorkeling a try this summer and see how it can become a new and exciting way to enjoy Missouri streams. ▲

Doug Novinger supervises the aquatic diversity and game fish unit in MDC's Science Branch. Exploring Ozark streams with his family and conserving rare fish and other aquatic species and their habitats are for him thrilling parts of being a native Missourian.

Youth Shooting Sports

A GATEWAY TO FIREARMS SAFETY, OUTDOOR SKILLS, AND SELF-CONFIDENCE

by Francis Skalicky | photographs by David Stonner



Members of the Southwest School of Washburn trap team compete at the state tournament in Linn Creek.





Ty Howard takes a turn busting clay targets at practice with his teammates from Southwest School of Washburn.

Your first thought when you go to watch a Southwest School of Washburn trapshooting practice may be that you've been given the wrong directions.

Turning off a paved highway to drive through a cattle-filled pasture doesn't seem to be a route that leads to the practice site of a program that's won state and national honors. Neither does going through two livestock gates — the first must be shut behind you so cows won't get out.

Seeing a small group of teens and almost-teens gathered around a lone trap machine in a fenced-off patch of pasture may still have you wondering about your whereabouts, but when shotguns start to crack, it becomes obvious you're at the right place. As they pulverize round after round of clay discs, these young shotgunners make it clear they are the latest generation of a Southwest School of Washburn trapshooting program that has won a long list of state and national honors in slightly more than

“Gaining confidence, meeting personal goals — those are things that will carry over into life and everything they do.”

— Kevin Boyer, Logan-Rogersville High School trap coach

two decades of existence, including 2010 AIM (Academics Integrity Marksman-ship) National Champion, 2018 AIM Sub-Junior Class C National Champion, and 2019 Missouri State AIM Sub-Junior Champion. Four Southwest School of Washburn shooters have been invited to Olympic tryouts at the Olympic Development Training Center in Colorado Springs, Colorado.

On a broader scale, these shooters are part of a growing group of young Missourians who participate in youth shooting sports. More important than

the trophies and plaques the shooters take back to their schools are the firearms safety tips, the outdoor skills, and the increased self-confidence that each shooter takes to heart.

“Our trapshooting program allows kids who may not be interested in mainstream sports, such as basketball, baseball, softball, volleyball, cross country, etc., an opportunity to represent our school and be part of a team activity,” said Mike Vining, who's coached Southwest School of Washburn's team for 21 years. “It gives those kids a sense of being a part of something while at school.”

Logan-Rogersville High School trap coach Kevin Boyer agrees.

“One of the best parts of coaching these kids is watching them mature into young men and ladies,” said Boyer, whose teams also have a long list of accomplishments, including winning the 2020 AIM National Championship. “Gaining confidence, meeting personal goals — those are things that will carry over into life and everything they do.”

A Growing Activity

Missouri's competitive youth shooting circuit consists of several governing bodies. Tournaments are affiliated with AIM, 4-H, FFA, the Scholastic Clay Target Program, and the Missouri High School League. Approximately 1,200 middle school and high school students compete in these programs.

"In Missouri, the sport is still growing," said Tony Shockley, the youth chairman of the Missouri Trapshooters Association. "We are especially seeing more and more young females coming into the sport. That's really exciting."

The popularity of youth sporting clay shooting activities isn't just a Missouri thing. The USA High School Target League, a national youth shooting organization, has grown from three participants in 2001 to 1,042 teams, which involve more than 32,000 participants. Minnesota's State High School Clay Target League Championship features more than 8,000 student shooters and is considered to be the world's largest trapshooting event.

MDC offers support to these programs by providing instructional staff and financial resources to 4-H shooting sports, the Missouri State High School Trap Shoot, and other groups.

"MDC encourages people to be engaged in all sorts of conservation activities," said MDC Hunter and Angler Marketing Specialist Eric Edwards. "One of the many activities we encourage people to be active in is shooting sports. Instilling an appreciation for these activities early in life increases participation in other outdoor pursuits."

MDC's five staffed shooting ranges located across the state are frequently used as practice sites by organized youth shooting teams, but no MDC facility is within range of Vining's Southwest School of Washburn shooters in southern Barry County. Located near the Missouri-Arkansas state line, the school's practice site is the 215-acre farm of Southwest School of Washburn alumni DeWayne Burns in nearby Gateway, Ark.

"You couldn't ask for a better bunch of kids," said Burns, as he leaned across a barbed wire fence. "They're all good kids."



Under the guidance of the coaching staff and parent volunteers, the team practices in a local cattle pasture, owned by a local landowner and offered to the team as a practice field.

What it Takes

It takes more than good manners to excel on the trap field, though. Trapshooting is one of three major disciplines of competitive clay target shooting — the others being skeet and sporting clays. In trapshooting, clay targets are launched from one “house,” which is generally away from the shooter. (In skeet shooting, targets are launched from two houses in somewhat sideways paths that intersect in front of the shooter, and sporting clays involves a more complex shooting course with many launch points.) The traphouse is located 16 yards in front of the shooter and targets are launched in a 44-degree fan pattern — some are launched straight away from the shooter while others are launched at angles to the left or right. Height of launch can also be varied.

Using a 12-gauge shotgun, shooters have only a second or two to make the correct trigger-pulling decision. Quick shots guarantee tight pellet patterns, but your gun must be on the target

for that tight pattern to be effective. Waiting too long to draw a bead on the disc will allow the pellet pattern to scatter too much to hit the target and the clay “bird” will sail to a safe, unbroken landing.

But hitting a fast-moving clay target that may erupt from a variety of angles is the easy part of a trapshooting competition. Doing it over and over again is the hard part. A shooter may pull the trigger on 200 targets over the course of a tournament. Miss more than two

and you probably won’t place first. Miss more than five and you probably won’t place at all.

“You have to focus on every shot because every shot counts,” said 16-year-old Southwest School of Washburn team member Ty Howard.

“The hardest part is that you have to be smooth all the way through,” said 10-year-old teammate Hunter Patterson. “And you have to concentrate.”

And shooters can’t let a miss mess with their concentration.

The team’s practice sessions have led to good results in competition, including a tie for first place by Ty Howard at the state tournament in Linn Creek. Students who shoot a perfect score commemorate the event by shooting their ball cap with their shotgun.



"A lot of being a good shooter is mental," Boyer said. "It's being able to let that one miss go and not turn it into two or three misses. At the highly competitive level, you may miss by 2½ feet. That means either your 2 feet are set wrong, or the problem is in the 6 inches between your ears."

Southwest School of Washburn shooter Olivia Ayer says she's all too familiar with the mental aspect of trapshooting.

"Sometimes things just get in my head," said the 16-year-old. "I know what I need to be doing — I just have to do it."

Level Playing Field

While becoming a better shooter may require mastering one's mental discipline, one thing not required is an excess of physical attributes.

"The shooting sports are non-discriminatory," said Allen Treadwell, a 2000 graduate of Southwest School of Washburn and the school's first — and undoubtedly most famous — competitive shooter. Treadwell has used the shotgun prowess that began in his days as a Barry County youth to win 17 gold medals, nine silvers, and 11 bronzes in international competition for the USA Shooting Team.

"Shooting doesn't care if you're male or female, if you're 6-foot-2 or 5-foot-10," said the Missouri Sports Hall of Famer. "Shooting doesn't care about the color of your skin or your gender. It's the only sport I know where a 13-year-old kid can compete with a 35-year-old on an equal footing."

Beyond the Competition

Skills learned on the trap field can be as beneficial on hunting trips as they are at tournaments.

"I think one of the biggest things these kids learn is that practice and patience pays off," Edwards said. "You can't rush your shot in competition or in the woods. There is pressure in both circumstances, but learning to deal with it on the range will translate into knowing how to deal with it in a tree stand."

Treadwell agrees.

"In competitive shooting, you're always in a high-pressure situation and you have to learn how to deal with that pressure," he said. "You have to learn how to deal with distractions and how to make split-second decisions. That helps me today as a hunter because I can stay a lot calmer in pressure situations. When I see that big buck come into range that I've been following all year — or several years — on my trail cam, do I still get excited? Sure I do. But I think because of all the things I've been through as a competitive shooter, I can stay calm and keep my wits about me and make good decisions as a hunter, too."

Firearms safety is also takeaway knowledge that is useful for the students long after their competitive shooting days have ended.

"Gun safety is at the top of all shooting fundamentals," Shockley said. "All the youth shooters are taught what proper gun-handling is and the repetition they go through in their firearm use plays a big part in learning firearms safety."

"Firearms safety has always been — and will always remain — at the forefront of what we do at practice and what we do during competition," Vining said.



Five stand sporting clays offer shooters at MDC ranges new challenges

Trap and skeet aren't the only shotgun sports that adult and youth shooters can enjoy at MDC staffed shooting ranges. Shooters at four MDC staffed shooting ranges can also test their shooting skills at five stand sporting clays, a shotgun activity that has targets launched from a variety of positions.

MDC's staffed shooting ranges that provide opportunities to shoot five stand are



Lake City Range (Jackson County), Andy Dalton Shooting Range and Outdoor Education Center (Greene County), August A. Busch Memorial Conservation Area Shooting Range and Outdoor Education Center (St. Charles

County), and Jay Henges Shooting Range and Outdoor Education Center (St. Louis County).

Five stand is a shotgun sport shooting activity with five stations — or "stands" — and six to eight strategically placed clay target throwers (called traps). Participants shoot in turn at various combinations of clay birds. Each station has a menu card that lets shooters know the sequence of clay birds they will be shooting (i.e., which trap the clay bird will be coming from). The shooter is presented with five targets at each station — first a single bird, followed by pairs. Pairs can either be "report pairs," in which the second bird will be launched after the shooter fires at the first, or "true pairs," which is when both birds are launched at the same time.

After shooting at the five birds on the menu at that station, the shooter proceeds to the next stand, where they find a new menu of five targets.

Treadwell said the competitive shooting sports do more than create better shooters and better hunters. They create better people.

"What these kids learn as a member of a team, what they learn from the discipline they need to have in order to become a good shooter; these are things that are going to make them better adults and better members of society," he said. ▲

Francis Skalicky has been the media specialist for MDC's Southwest Region since Jan. 1, 1996. He lives in Springfield and tries to enjoy the outdoors with his family as often as possible.

Get Outside

in AUGUST

→ Ways to connect with nature



Snail



Mussels



Crayfish

Poking Around the Pond

Late summer is a great time to go poking around the edges of ponds and lakes to see what kind of aquatic life you can find. Missouri's streams, lakes, and other aquatic habitats hold thousands of kinds of invertebrates — worms, freshwater mussels, snails, crayfish, insects, and other animals without backbones. These creatures are vital links in the aquatic food chain, and their presence and numbers tell us a lot about water quality. To help identify what you might see, visit short.mdc.mo.gov/Zry.

Let the Sunflowers In

Sunflowers are a major highlight of late summer. Their late-season bloom time almost seems like summer's last ditch effort to hang on a little longer. Did you know there are 16 different species of sunflowers recorded in Missouri, not counting hybrids? These cheery yellow blooms are like sunshine in a field. Soak it in while you can.



Ashy sunflower



Wolf spider

The Mother Load

Look out for mother wolf spiders! They are doing double duty this month, carrying on with normal life while carrying their pea-sized egg sacs on their spinnerets. It's a mother of a job!

Natural Events to See This Month

Here's what's going on in the natural world.



Indigo buntings sing on hot, humid summer afternoons



Cave-dwelling bats begin mating



Striped bass and walleye head for cold water

VIRTUAL

Native Plants

Thursday • Aug. 19 • 12–1 p.m.

Virtual event at Anita B. Gorman Conservation Discovery Center,
4750 Troost Ave., Kansas City, MO 64110

Registration required at the Deep Roots website at
deeproots.org/native-plants-at-noon

We'll virtually tour the native landscape at MDC's Anita B. Gorman Conservation Discovery Center. Guided by native landscape specialists Alix Daniel and Cydney Ross, this monthly series features a live look at native plants of interest throughout the year. This program is a partnership with Deep Roots.

Combing for Mushrooms

As you walk through the woods, try looking up at the trunks of the trees. You might come across a white, almost coral-like mass. These are **comb tooth mushrooms**, and they appear in August through October. Considered choice edibles, they are tasty when found young, fresh, and white. They get sour and bitter as they mature and turn tan.



Comb tooth mushroom

NORTHWEST REGION

Reptiles: Snakes!

Thursday • Aug. 26 • 6–7 p.m.

Registration required at 888-283-0364 or short.mdc.mo.gov/ZrF.
All ages.

Come out and learn about some of our Missouri snakes. There will be live snakes at the program!

Speckled kingsnake



Conservation Nature Centers



BURR OAK WOODS

Blue Springs | mdc.mo.gov/BurrOakWoods

CAPE GIRARDEAU

Cape Girardeau | mdc.mo.gov/Capecnc

DISCOVERY CENTER

Kansas City | mdc.mo.gov/DiscoveryCenter

POWDER VALLEY

Kirkwood | mdc.mo.gov/PowderValley

RUNGE

Jefferson City | mdc.mo.gov/Runge

SHOAL CREEK

Joplin | mdc.mo.gov/ShoalCreek

SPRINGFIELD

Springfield | mdc.mo.gov/Springfieldcnc

TWIN PINES

Winona | mdc.mo.gov/TwinPines

Discover nature with us.

Places to Go

NORTHWEST REGION

Cooley Lake Conservation Area

Oxbow lake offers birding, gigging, and bowfishing

by Larry Archer

✳ Once part of the Missouri River's main channel, Cooley Lake is now a remnant oxbow lake that offers little in the way of traditional fishing, but plenty of action for birders, giggers, and bow-fishers.

Years of accumulated silt have left the once-deep main channel a shallow wetlands lake, making it a draw for migrating waterfowl, said Cooley Lake Conservation Area (CA) Manager Chris Blunk.

"Cooley's big thing is migratory birds in the fall and spring," Blunk said. "But there's still a lot of upland birds in August."

Located on the nearly 1,350 acres in Clay County, Cooley Lake's shallow August waters also draw frog giggers and bow-fishers, he said.

"Frogging is a big thing at Cooley, too," he said. "It's kind of late in the frogging season, but it's still going on."

As opportunistic wetlands, Cooley Lake CA relies on runoff and flooding from the nearby Missouri River to replenish its water and occasionally provide prey for bowfishers.

"If there's water that's running through the structures, if we do have rainfalls, there's quite a few bow-fishermen that utilize the area as well because the gar and the carp get in there from the river," Blunk said.



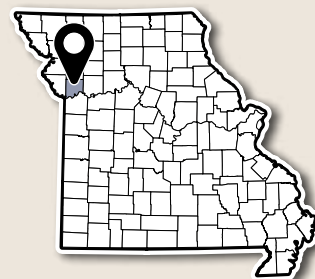
"There's a lot of different birds through that timber, and there are shorebirds that can be visible depending on the water elevations."

—Cooley Lake CA Manager
Chris Blunk

DAVID STONNER



The Missouri River, as seen from the Cooley Lake CA boat ramp, is the main source of water for the area's oxbow lake. Nearly 2.5 miles of trail wind through the woods along the lake's northeast side (inset).



COOLEY LAKE CONSERVATION AREA







consists of 1,345.1 acres in Clay County.
From Missouri City, take Highway 210 east
2.5 miles to the area.

39.2374, -94.2389

short.mdc.mo.gov/ZDi

816-858-5718

WHAT TO DO WHEN YOU VISIT

-  **Birdwatching** Included in the Great Missouri Birding Trail (short.mdc.mo.gov/ZDU). The eBird list of birds recorded at Cooley Lake CA is available at short.mdc.mo.gov/ZDw.
-  **Camping** Youth group camping. Special use permit required.
-  **Fishing** Missouri River access available, including concrete boat launch.
-  **Hiking** Designated hiking trails totaling 2.5 miles. Levees also accessible for hiking.
-  **Hunting Deer and turkey** Deer and turkey regulations are subject to annual changes, so refer to the Spring Turkey and Fall Deer and Turkey booklets for current regulations.
Also **dove, rabbit, and squirrel**
-  **Trapping** Special use permit required.

WHAT TO LOOK FOR WHEN YOU VISIT



Belted kingfisher



Red-eared slider



Muskrat



Northern diamond-backed watersnake



Bald Eagle

Haliaeetus leucocephalus

Status

Species of Conservation Concern

Size

Length: 36 inches; wingspan: 84 inches

Distribution

Statewide

Bald eagles, our national symbol, are usually seen near lakes, rivers, and marshes as they forage for fish or carrion. Mature bald eagles have a dark brown body with white head and tail. Females are larger than males, but otherwise they look alike with their large, hooked bill, strong talons, and yellow eyes. In flight, bald eagles soar on rising warm air currents on flattened wings. Juveniles are all brown, with white speckles. Their sound is a series of chirps or a loud screaming whistle.



Did You Know?

The bald eagle's return to the Lower 48 is a conservation success story. Although historically about 20,000 pairs nested in the United States, humans played a large role in the decline of eagles in the 1900s. These birds were shot, trapped, and poisoned, and they also declined as a result of pesticide-related nesting failures. By the 1950s, only about 3,000 pairs were nesting. Today, over 10,000 pairs nest in the United States annually, including about 200 in our state, as of 2010.



LIFE CYCLE

Bald eagles generally mate for life. The nest is large, reaching 13 feet deep and 8 feet across. An eagle pair produces one to three eggs annually, but rarely do all survive. Bald eagles reach maturity by 4 or 5, acquiring adult plumage by age 5. They can live for more than 30 years.



FOODS

Bald eagles prey on a variety of live animals and also eat carrion. Fish and carrion make up most of their diet, but reptiles, amphibians, small mammals, other birds, and large invertebrates, such as crayfish, are also eaten.



ECOSYSTEM CONNECTIONS

As scavengers and top predators, bald eagles suffered from pesticides that accumulated in the bodies of the many insects, insect eaters, and other small predators beneath them in the food chain.

Outdoor Calendar

❖ MISSOURI DEPARTMENT OF CONSERVATION ❖



FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:

- ▶ Catch-and-Keep:
May 22, 2021–Feb. 28, 2022

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2021

Nongame Fish Giggling

Impounded Waters, sunrise to sunset:
Feb. 16–Sept. 14, 2021

Streams and Impounded Waters,
sunrise to midnight:
Sept. 15, 2021–Feb. 15, 2022

Paddlefish

On the Mississippi River:
Sept. 15–Dec. 15, 2021

Trout Parks

Catch-and-Keep:
March 1–Oct. 31, 2021

Catch-and-Release:
Nov. 12, 2021–Feb. 14, 2022

HUNTING

New Black Bear Hunting Season

MDC will offer Missourians the state's first black bear-hunting season in modern history starting this fall. Learn more at short.mdc.mo.gov/ZrK.

Black Bear

Oct. 18–27, 2021

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2021

Coyote

Restrictions apply during April, spring turkey season, and firearms deer season.

Open all year

Crow

Nov. 1, 2021–March 3, 2022

Deer

Archery:

Sept. 15–Nov. 12, 2021
Nov. 24, 2021–Jan. 15, 2022

Firearms:

- ▶ Early Youth Portion (ages 6–15):
Oct. 30–31, 2021
- ▶ November Portion:
Nov. 13–23, 2021
- ▶ Late Youth Portion (ages 6–15):
Nov. 26–28, 2021
- ▶ Antlerless Portion (open areas only):
Dec. 4–12, 2021
- ▶ Alternative Methods Portion:
Dec. 25, 2021–Jan. 4, 2022

Dove

Sept. 1–Nov. 29, 2021

Elk

Archery:
Oct. 16–24, 2021

Firearms:
Dec. 11–19, 2021

Groundhog (woodchuck)

May 10–Dec. 15, 2021

Pheasant

Youth (ages 6–15):
Oct. 30–31, 2021

Regular:
Nov. 1, 2021–Jan. 15, 2022

Quail

Youth (ages 6–15):
Oct. 30–31, 2021

Regular:
Nov. 1, 2021–Jan. 15, 2022

Rabbit

Oct. 1, 2021–Feb. 15, 2022

Sora, Virginia Rails

Sept. 1–Nov. 9, 2021

Squirrel

May 22, 2021–Feb. 15, 2022

Teal

Sept. 11–26, 2021

Turkey

Archery:
Sept. 15–Nov. 12, 2021
Nov. 24, 2021–Jan. 15, 2022

Firearms:
▶ Fall: Oct. 1–31, 2021

Waterfowl

See the Migratory Bird and Waterfowl Hunting Digest or visit short.mdc.mo.gov/ZZx for more information.

Wilson's (Common) Snipe

Sept. 1–Dec. 16, 2021

Woodcock

Oct. 15–Nov. 28, 2021

For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at short.mdc.mo.gov/Zib. Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at short.mdc.mo.gov/ZZf.



Free MO Hunting and MO Fishing Apps

MO Hunting makes it easy to buy permits, electronically notch them, and Telecheck your harvest. MO Fishing lets you buy permits, find great places to fish, and ID your catch. Get both in Android or iPhone platforms at short.mdc.mo.gov/Zi2.



**Follow us
on Instagram**

@moconservation

Don't let the sun set on your summer without getting out to discover a new conservation area, like Otter Slough Conservation Area in Dexter. Need help finding an area? Check out our free mobile app, MO Outdoors, available in Android or iPhone platforms at mdc.mo.gov/mooutdoors. Let the adventure begin!

📷 by **David Stonner**

Subscribe online | mdc.mo.gov/conmag | Free to Missouri households